

# Success Stories from the IEA DSM Technology Procurement Program

Paper for the International Conference on Energy Efficiency in Distribution and Usage of Electricity  
Ankara, Turkey - April 3-4 2000  
Hans Westling

## Abstract

Annex III "Cooperative Procurement" within the IEA DSM Implementing Agreement with 8 countries and the European Commission as participants has been going on during 1994 – 1999. A procedure for collaborative procurement actions for introduction of innovative, more energy-efficient products has been developed and tested in a number of pilot projects. A clothes dryer with the energy use cut by half (the first "Class A" dryer), electric motors with losses reduced with 20-40% and a "copier of the future" using only 25% of the energy consumed in normal solutions, are concrete results. After evaluation of proposals and prototypes, the suppliers have received the "IEA DSM Award of Excellence". The award-winning dryer from AEG and an energy-efficient motor from ABB were included among the successes shown at the IEA 25<sup>th</sup> Anniversary and Ministerial Meeting in Paris in May 1999. Formulation of performance criteria and creation of mechanisms for recognition are two important elements in technology procurement efforts.

## 1. Annex III and the IEA DSM Agreement

Annex III "Cooperative Procurement" is one of nine different Tasks within the International Energy Agency (IEA) Demand-Side Management (DSM) Agreement, which has fifteen IEA member countries and collaboration with international organisations like the European Commission and The World Bank.

## 2. Objectives

The objectives of Annex III have been to establish a cooperative demand-pull procedure to bring more energy-efficient and environmentally-adapted demand-side management technologies to the marketplace, to rank innovative candidate technologies for competitive procurement activities, and to procure key DSM technology options that have not yet reached the marketplace in order to demonstrate and test the procedure developed.

The following countries and organisations have taken part in Annex III: Denmark, Danish Energy Agency; Finland, Motiva; Korea, KEMCO; Netherlands, NOVEM; Spain, ENHER; Sweden, Swedish National Energy Administration -STEM - (earlier NUTEK); United Kingdom, DETR, BRE and ETSU; United States, U.S. Department of Energy (DOE) and the Environmental Protection Agency (EPA); and the Commission of the European Union, DG XVII, Energy. The Operating Agent for Annex III has been Hans Westling, Promandat AB, acting on behalf of the Swedish National Energy Administration.

## 3. Need for new merchants

IEA and the European Commission have stated in their programs that it is urgent to follow up the Rio, Kyoto and Buenos Aires Climate Agreements with concrete actions. The member countries of the organisations have agreed to contribute to reducing the risks of climate change, to remove barriers to market deployment of effective energy technologies, and to create a real market transformation.

Many mechanisms have already been used in programs for *energy reduction* through development and diffusion of more energy-efficient solutions, through influence of habits, and through development of new *energy sources*.

Use of mandatory regulations, as well as large rebate programs, will encounter increasing difficulties and opposition, and also, in many cases, lack of funding. Recent trends are towards more individual choices and privatization, which will reduce the possibilities for government interventions using traditional methods. This will mean that fragmentation, as a whole, will increase, which can lead to limitations to achieve the climate convention goals and the environmental objectives.

In many areas, users and buyers are, in general, very fragmented. Joint actions within countries, and actions involving several countries, can give stronger signals to suppliers for further development work of new solutions. The actions can influence suppliers to accelerate the introduction into the marketplace of solutions that already exist in the laboratories, and to further refine products already marketed. Manufacturers are very concerned in reducing the risks involved in the development of their new products. They strive to come close to their customers in order to really understand their needs, when they develop and refine their products. Procurement activities with innovative purposes can offer a good alternative for governments, buyers and users, and also for manufacturers, to bring about reliable solutions that are quicker accepted on the market. While keeping up the competitive situation, technology and cooperative procurement can open up for fruitful collaborative work between buyers, and also between buyers and suppliers.

#### 4. Definitions

*Technology procurement* may be characterized as an entire acquisition process aimed at directly stimulating innovation. It is not exclusively associated with any particular form of contract, though it is closest to design/build contracting with functional requirements and functional procurement.

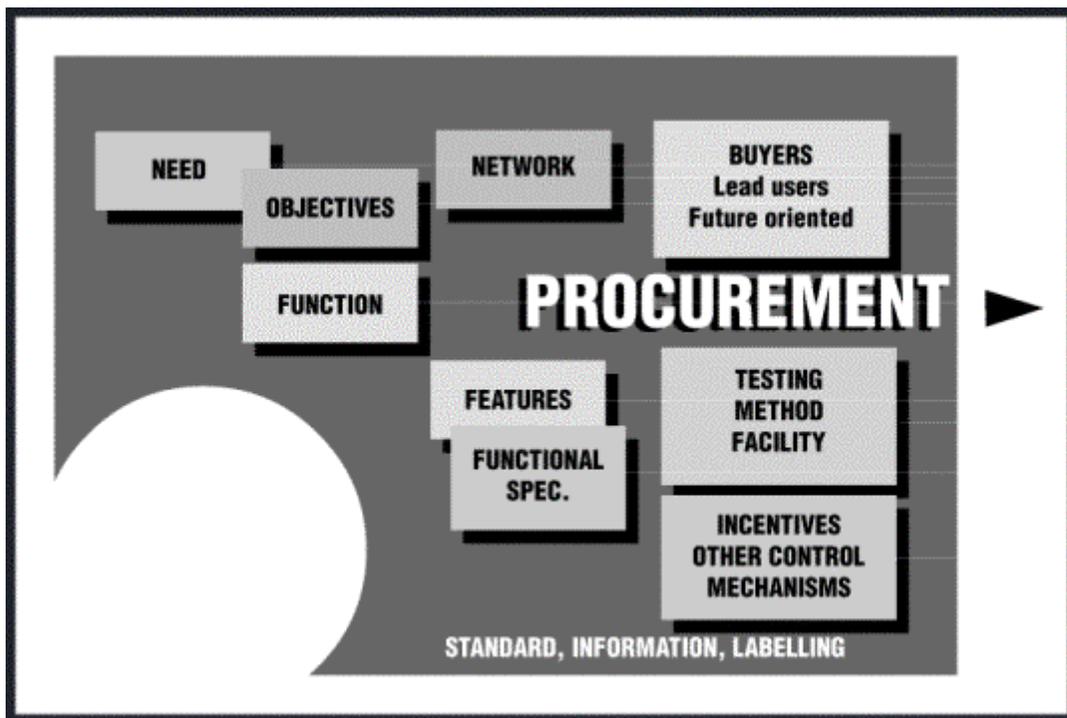


Figure 1. The technology procurement process – some important steps<sup>1\*</sup>

The most influential buyer, or a number of *buyers* in combined efforts, formulate the requirements and evaluate the products. The market transformation is further influenced by support activities (rebates, information, labeling, awards, etc).

In some cases, the buyers represent only public organisations. In other cases, they may include private companies, individuals, or combinations of public and private organisations.

## 5. Accomplishments and unique contributions

The Operating Agent and the Experts in Annex III have developed a preliminary process, which has been documented in the report "Cooperative Procurement. Market Acceptance for Innovative Energy-Efficient Technologies"<sup>2)</sup>. The report includes a broad background of achievements obtained using demand-side mechanisms similar to procurement in a number of countries, analysis of findings from cases where they have been practiced and definition of a process (Figure 1). It also points out the problems and barriers to handle during the projects. Important issues are the need to combine procurement with other support actions and to start work in pilot areas that are not too complicated (Figure 2). It is judged to be much easier to work with single components, or single systems, than with complicated systems, or whole building facilities, especially when different climatic conditions and cultural factors may have a large influence on the project.

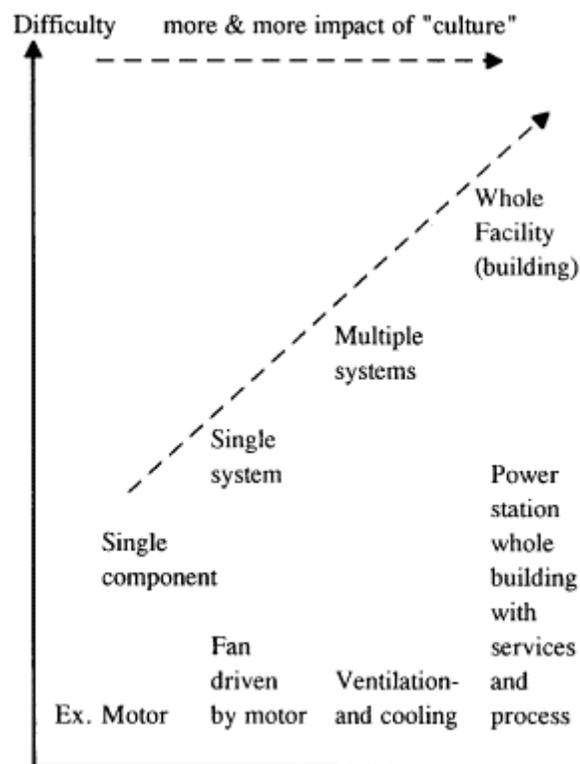


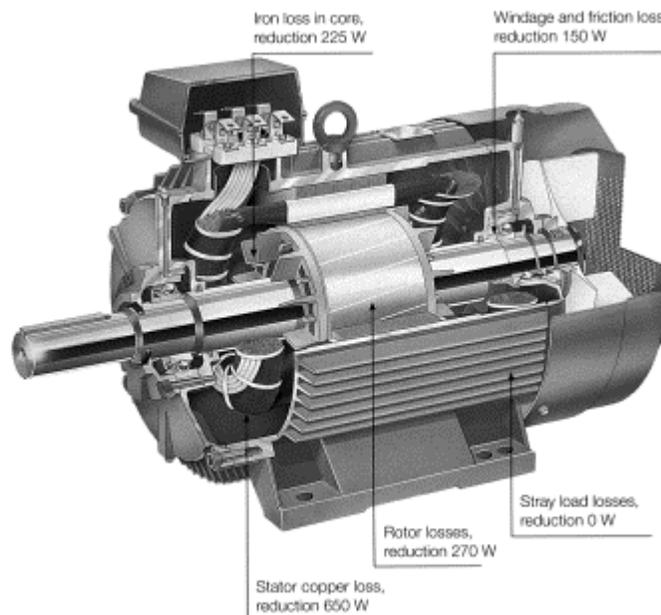
Figure 2. Product complexity "ladder".

Already in 1994, three possible areas for pilot procurement were discussed during a Workshop in Paris November/December 1994 which was organised by Annex III. These areas were "Wet Appliances" (clothes washers and dryers), "Lighting" and "Copiers". From a whole range of different possible areas, seven areas were later identified for joint actions. During the preparations, the process was more oriented towards a combination of procurement and promotion, and also towards the introduction of alternative ways of recognizing successful new products, not necessarily through guaranteed large-volume purchasing. An award - the "IEA DSM Award of Excellence" - was introduced. This award has been presented in three project areas in "Wet Appliances" for a dryer with energy consumption reduced to 50% and being the first "Class A" heat-pump dryer on the European market (Illustration 1); in "High-Efficiency Motors" for two

motors of different sizes where the losses have been reduced by between 20 and 40% ([Illustration 2](#)); and in "Copier of the Future" ([Illustration 3](#)) for a copier which shows possibilities for energy reductions down to 25%.



Illustration 1. The winning AEG heat-pump dryer – the first European "Class A" dryer



*Illustration 2. Longer lifetime through reduced losses – ABB winning motor M2BA280. An overview of the Annex III pilot projects is shown in [Table 1](#).*

<b>Pilot Projects</b>	<b>Project Manager</b>	<b>Energy Reduction Goal</b>	<b>Results</b>	<b>Main Lessons *</b>
<i>Wet Appliances:</i> IEA DSM dryer Promotion Competition	The Netherlands	50%	Entry fulfills all criteria	Market plans should be a condition for submitting an Award
<i>Lighting:</i> Replacement Incandescent Lamp – Future Bulb – Competition	United Kingdom	30%	One entry, not fulfilling all criteria. Subsequent one-off prototype produced which apparently meets criteria.	Competing with other important development projects among manufacturers, as CFLs
<i>Copiers:</i> Copier of the Future Competition	United States	By 70-75% down to 30%	Entry and prototype fulfilling all criteria	Receipt of the <u>Award</u> was the real challenge which was the driving force
<i>Industrial Motors:</i> IEA Hi-Motors Competition	Finland	20-40% reduction of losses	2 prototypes fulfilling all criteria	The Award was the real challenge. Most motors bought by systems suppliers, low initial purchase price important.
<i>LED Traffic Signals</i>	Sweden in collaboration with The Netherlands	Reduction of: energy costs 35-95%, maintenance costs 50-75%	In starting phase	Different interest in different countries concerning individual lamps or whole signal heads
* 60 different lessons identified by Project Managers in London Workshop Report				

**Table 1. Overview of Annex III Pilot Projects**

The creation of buyer groups, the working out of performance specifications and the combination with different support activities have been stressed. It is especially important to include dominant, future-oriented buyers or users and, in many fragmented areas, to create a new network, where trust will be built up between the participants. Efforts should be made to include as many stakeholders as possible in the process.

The different pilot projects are summarised in [Appendix 1](#). In addition to the five initial areas identified, the “Hi-Motors” and “LED Traffic Lights” areas have also been included.

Two of the Annex III pilot projects were mentioned as successful examples of IEA projects at a presentation in connection with the IEA 25<sup>th</sup> Anniversary in May 1999, and two of the pilot products – the dryer and one of the motors – were also on show on that occasion.



Illustration 3. "Copier of the future" - The winning Ricoh copier

IEA DSM Annex III "Cooperative Procurement" Appendix 1  
OVERVIEW OF PILOT PROJECTS (for experience of collaborative international work)

PROJECT AREA	Lighting: Replacement Incandescent Lamp – Future Bulb	Wet Appliances: Dryer Promotion Competition	Copiers: Copier of the Future	Consumer Electronics: Energy Efficient TV sets, decoders etc.	Vending machines	Industrial Motors and Components: IEA Hi-Motors Competition	LED Traffic Lights
1 Main goals	30% more efficient 3,000 burning hours LCC goal Dimmable, appearance as GLS lamp	50% energy reduction on household electric tumble dryers, maximum price.	Low-power standby mode >90% energy reduction, total direct energy reduction >60%. Short recovery time.	Reduction of electricity consumption by procurement or other more informative actions supporting other ongoing projects.	Energy-reduction opportunities for future actions: Cold-drink machines 60%; Hot-drink machines 30%.	Decrease losses 25-50% compared to average motors.  Price & performance level guaranteeing long-lasting significant market share.	Reduced energy by 35-90%, longer life, LCC goals. Reduced costs for service and maintenance. Goal: pay-back time 1-5 years.
2 Project Manager	Project Manager Paul Davidson, UK. Project Coordinator Nils Borg, Sweden.	René Kemna, Netherlands. Alternate: H-P Siderius, Netherlands.	Rachel Schmeltz  Alison ten Cate, USA.  Bernard Aebischer, Switzerland during 1 <sup>st</sup> part of proj.	Olof Molinder, Sweden (during introductory phase)	Eva Lembke/Preben Munter, Denmark (temporary, 1 <sup>st</sup> phase)	Heikki Härkönen, MOTIVA, Finland.	Nils Borg, Sweden, on behalf of Swedish cities.

3 Interested countries	United Kingdom, Finland, The Netherlands, Sweden supporting ongoing US/DoD project.	The Netherlands, Sweden, United Kingdom, Spain, Finland, Denmark (supportive participation).	Finland, Netherlands, Sweden, Switzerland, United Kingdom, United States, Support: European Commis.	Sweden, United Kingdom; Netherlands, United States (supportive participation) European Commission	Denmark, The Netherlands, USA (support.). Design competition planned in US for univ. etc.	Finland as main actor; The Netherlands, United Kingdom, Denmark, Sweden, European Commission	Netherlands, Finland, Sweden, United Kingdom, in collaboration with CEE in United States.
4 Technical specialists	Francis Rubinstein, LBNL, United States  David Loe, United Kingdom	Jury: A. Klag, UK,  H. Goerlitz/K. Koeppe, Germ.  A. Horowitz, Sweden  P. Terpstra, Netherlands	Peter Jeanmaire, France  Jeff Harris, US, Peter Hill, UK, Bruce Nordman, US, Göran Bryntse, Sweden.	Chris Evans, Consumer Association, United Kingdom.	Preben Munter, SEAS, Denmark.	Jorma Haataja and Juha Pyrhönen, Laapeenranta University of Technology, Finland.	Within City of Stockholm, Lighting Research Centre (Troy, NY, USA), National Road Administrations, technical consultants, user studies.
5 Project Status:	Ready  Draft Oct. 96, final Apr. 97  Governments, housing comp., retailers, electric utilities	Ready  February 1997  Retailers, utilities, housing and mail order companies; Workshop Nov. 15 1996	ZESM feasibility study ready September 1998  Governments, banks, insurance companies, universities, large corporations.	Partly ready.  Developed for TV-sets. Hotels TV-set rental firms  Procurement power supplies suggested by EC Nov. 97	Partly ready.  Universities, hotel chains, governments, coffee and softdrink distributors.	Ready  Ready June 1997  More than 30 industrial companies in Finland. No similar group in other countries.	Sept. 1999  Oct. 1999 - Nov. 2000  Sept. 1999 – Oct. 2000
6 Official preinformation	EU "Official Journal"  29 March 96 and 16 Apr. 97	EU "Official Journal",  15 May 1996	EU "Official Journal",  31 July 1996			EU "Official Journal",  19 September 1996	EU "Official Journal",  15 April 1999
7 Manufacturer contacts	At Hanover Fair 23 April 1996, and Hanover Fair  16 April 1997	Informal meetings 1996,  15 November 1996;  Domotechnica Fair, Cologne, 19 February 1997	Meeting: Stockholm Sept. 11, 1996, Washington D.C. Dec. 2, 1997, Sept. 10, 1998	General information at office equipm. conferences & projects. EC/SAVE study /seminar Florence Nov. 97		Information meetings in connection with motor conferences in Lisbon Oct. 96 and in UK in Sept. 97	Important to have early and neutral contacts.  Kick-off meeting in Stockholm, Sept. 1999
8 Call for tenders	Apr. 97 Hanover Fair, reissue Dec. 97, deadline Dec. 1998.	February 1997 at the Domotechnica Fair, Cologne.	September 22, 1998			24 June 97 on website; closing date opening round 15 Aug 98	June 2000 – Jan. 2001
9 Evaluation of bids and prototypes	Dec. 1998. Planned to start after receipt of poss. Tenders.	Summer 97 – Winter 1998  (1 Jan. 1999)	Through Sept. 2000, accepting tenders every 6 <sup>th</sup> month.			15 Aug. 98 - 7 Dec. 98 (publ. jury report) Winner announ. Feb. 99.	Sept. 2000 – April 2001
10 Products on market	During 2000	1997 – 1999	September 2001			Available on request	Sept. 2000 – 2002

<p>11 Other information</p>	<p>The Buying Agency (TBA) in the UK willing to assist with call for tenders. No entry fulfilled all criteria. In a magazine a prototype presented Nov. 1999.</p>	<p>AEG First Round Award Winner fulfilling all mand. requirem. Ceremony 27/4 98. Start of Final Round Spring 98. Closing date 1 Jan. 1999. No entry in 2<sup>nd</sup> Round but a new product "EcoDryer" launched in 99. Cost reducing program 2000 and prolonged campaign price.</p>	<p>Documentation available at: <a href="http://www.epa.gov/appdstar/esoe/techpro.html">http://www.epa.gov/appdstar/esoe/techpro.html</a>  Ricoh Award, Winner First Round Ceremony at COMDEX/Fall, Las Vegas, 16 Nov. 1999. Prototype and Award on show at CeBit, Fair, Hanover, Febr. 2000.</p>	<p>No pos. reactions by Oct. 96 from US hotels. Project in rest mode. 2 procure. areas identified in EC/SAVE. Meetings 98-99 re oppor. IEA workshop Paris Jan. 1999, Brussels Jan. 2000.</p>	<p>Testing method to be defined. Denmark stated Mar. 97 no possibility to take Proj. Man. Project in rest mode.</p>	<p>Documentation available at:  <a href="http://info.lut.fi/ente/sahko/Hi-Motors/Intro.htm">Http://info.lut.fi/ente/sahko/Hi-Motors/Intro.htm</a>  Presentation at EEMODS, London, Sept. 1999.</p>	<p>Two efforts:  Short run: replacement lamps, further investigation,  Local procurement activities  Long run: whole systems  PM Netherlands/Sweden</p>
-----------------------------	---	---	--	--	---	--	---

Hans Westling, 25 February 2000

## References

<sup>1\*</sup> Westling, H. *Buyer Co-operation for Energy Efficient Appliances. Creative Buyer Groups with Goal and LCC Orientation – New Project Management Area*. Paper for the Project Management Institute Conference, Vancouver, October 1994.

<sup>2\*</sup> Westling, H. *Co-operative Procurement. Market Acceptance for Innovative Energy-Efficient Technologies*. IEA/NUTEK B1996:3. Stockholm.